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Titian Ramsey Peale (1800-1885).

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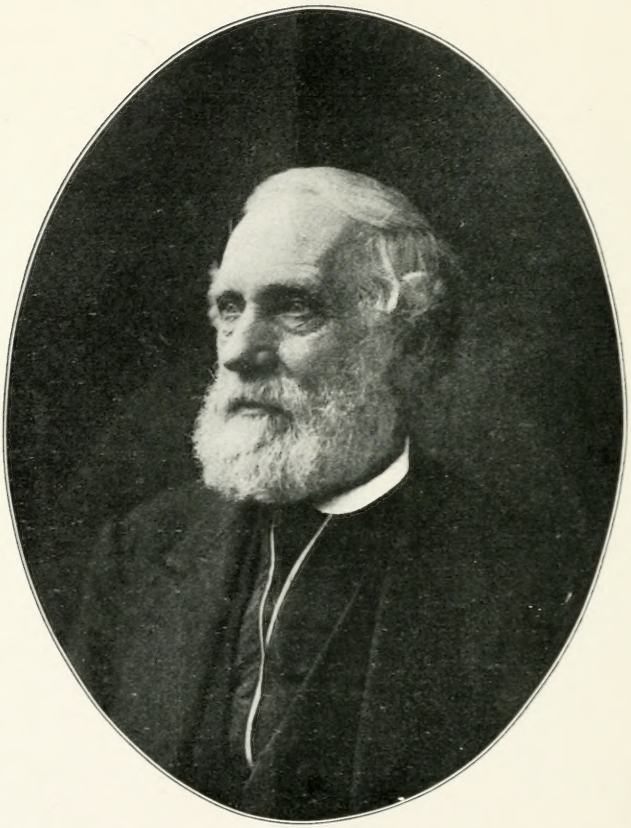

T. R. Peale

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXIV. JANUARY, 1913. No. 1.

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Titian Ramsey Peale.

(Portrait, Plate I)

Following our practice of the last two years in placing a portrait of one of the older American entomologists on the cover of the NEWS, we have selected for the frontispiece and for the cover for 1913 the portrait of Titian Ramsey Peale.

Titian R. Peale published in 1833 a work entitled *Lepidoptera Americana** which seems never to have passed beyond a single small installment.

*Lepidoptera Americana: or, Original Figures of the Moths and Butterflies of North America; in their various stages of existence and the plants on which they feed. Drawn on stone, and coloured from nature; with their characters, synonyms, and remarks on their habits and manners. By Titian R. Peale. Curator of the Philadelphia Museum. Vol. I. No. 1, Philadelphia: Printed by William P. Gibbons, S. W. corner Sixth & Cherry Sts., 1833.

The copy of Number 1 in the library of the Academy of Natural Sciences of Philadelphia comprises 14 unnumbered pages of text and 4 colored plates numbered 3 to 7; the size is 8¼ x 10½ inches. Accompanying this single part is a printed sheet of "The Proposals for Publishing by subscription a work to be entitled Lepidoptera Americana" which state that "the work will consist of one hundred Plates," in Numbers of four Plates, to be regularly published every two months, at Ten Dollars a year; a few other uncolored plates with Peale's autograph and the date 1836, and some unpublished manuscripts.

He was chiefly known, however, as an illustrator of books in various branches of natural history, such as Thomas Say's *American Entomology* (1824-28), a number of the plates of which bear his name. It is possible that it was to Peale that Say referred in his letter to J. F. Melsheimer, dated from Philadelphia, July 30, 1816, and published by Mr. W. J. Fox in the NEWS, volume XII, page 140 (1901), as follows: "On the lid of the box within you will find two plates of insects intended for my American Entomology they are all to be coloured—I send you the plate of G. *Tityus* as the first one that I have had coloured you will not criticise it with too much severity as the artist is young & will improve." This plate is No. 4 of the first volume of Say's work and is unsigned. Peale, at the time of the writing of this letter was about sixteen years of age.

Peale's association with Say is shown by passages in two others of the latter's letters to Melsheimer. In that of June 10, 1818 (Ent. News, XII, p. 234), Peale is mentioned as one of the party who accompanied Say on his collecting trip to Florida, while that dated March 13, 1819 (*l. c.*, p. 281) reads. "Mr. T. Peale will accompany me [on Major Long's Western Expedition to the Rocky Mountains] to prepare the skins of such animals as may be discovered." Occasionally in the *American Entomology*, Say quotes observations by Peale.

Peale's collection of Lepidoptera is still preserved at the Academy of Natural Sciences of Philadelphia, partly in his original boxes in the form of books measuring 9½ x 11¾ x 2 inches. Under each of the two covers of each book is an inner cover of glass, to the inner surface of one of which are fastened small disks of cork, a specimen being pinned in each disk. The distance between the glass covers is about 1¼ inches and the enclosed space is tightly sealed, but both surfaces of each specimen can be clearly seen. One of these boxes contains the type of Say's *Hipparchia* [=*Chionobas*] *semidea* with a record to the effect that it is the original of the plate in the *American Entomology*. This record has been quoted in the NEWS, volume XIII, page 12 (1902).

Appleton's *Cyclopedia of American Biography,* volume IV, New York, 1888, contains a brief sketch of Titian Ramsey Peale, stating that he was born in Philadelphia in 1800 and died in the same city, March 13, 1885. He was the son of Charles Willson Peale (1741-1827), artist and portrait painter and founder of Peale's Museum*; Rembrandt Peale (1778-1860), also a well-known portrait painter, and Raphaelle Peale (1744-1825) were brothers of Titian R. Titian R. accompanied the United States Exploring Expedition under Lieutenant Wilkes in 1838-1842, and was an Examiner in the Patent Office at Washington from 1849 to 1872.

New Species of Heterocera from Brazil (Lepid.)

By W. Schaus, London, England.

Ormiscodes hortensia sp. n.

♂. Head and collar dark brown. Thorax olive brown mottled with light brown hairs. Abdomen brown red banded with black.

Fore wings greyish buff mottled with olive brown scales, and with some irregular fine fuscous horizontal streaks; an indistinct darker subterminal shade, expanding on costa into a better marked fuscous brown shade; a large triangular space medially on costa, dark olive brown mottled with pale hairs, edged by a fuscous line inwardly oblique from costa to below cell, rounded and vertical to costa, slightly lunular outwardly and enclosing a fuscous streak on discocellular.

Hind wings bright brown on base and inner margin, shading to darker brown outwardly and towards costa; a dark discal spot; a fuscous brown postmedial line; a broad subterminal fuscous shade; termen coloured like fore wings.

Ex. 85 mm.

Hab. Piassaguera, São Paulo.

*Peale's Museum, a private enterprise, was also known as The Philadelphia Museum and was an entirely distinct institution from the Academy of Natural Sciences. Most of its contents were destroyed by fire or scattered among various owners after a somewhat checkered existence.

Dirphia picturata sp. n.

♂. Head, collar, and thorax dark brown. Abdomen brownish black dotted with white; basal segment bright red; fine reddish brown segmental lines, anal hairs yellow brown.

Fore wings: a dark brown oblique shade at base reaching antemedial line on inner margin, the space above it lilacine buff mottled with whitish hairs, limited by the antemedial line, which is fuscous brown, finely pale, edged inwardly, vertical on costa, outcurved and angled in cell, almost vertical below cell, somewhat outbent on inner margin. Wing beyond brown shaded with fuscous brown in cell; an irregular white spot on discocellular, containing a fuscous grey line following its outline, being narrow in front and slightly inbent, somewhat constricted medially, and broader behind; beyond cell on vein 5 are two small white spots with grey centers, almost suffusing; on one wing there are some small dots on vein 6, and one on vein 2 near outer line; this line is fuscous brown, slightly inbent from costa, followed by a pale brown and then a lilacine shade; subterminal fuscous brown spots connected by an indistinct line; from vein 4 to 6 the spots suffuse with the terminal shade which is dark brown, narrowing towards apex and tornus which are filled with the lilacine shade.

Hind wings brown shaded with red at base; hairs on inner margin red; a reddish brown spot on discocellular, pale edged; a fuscous brown postmedial and subterminal shade, the latter followed by a lilacine shade.

Fore wings below grey brown shaded with red on inner margin; a black discal point; an outer lilacine shade, darker edged.

Hind wings below lilacine to just beyond cell; a medial brown shade; a fuscous brown small spot; terminal space brown; a subterminal lilacine shade.

Ex. 62 mm.

Hab. Joinville, Brazil.

Automeris coronis sp. n.

♂. Head and collar dark brown. Thorax brown, shading to reddish brown behind, the patagia tipped with yellow buff. Abdomen roseate brown, with very faint smoky grey transverse lines.

Fore wings brown, darkest at base and beyond outer line; antemedial line remote from base, fine, fuscous outcurved to vein 2, and again to submedian, marked with pale points on veins; medial space paler, tinged with grey, the discal spot very large, light brown marked with two black points on inner edge, four on outer; a vertical brown postmedial shade from costa to line, this latter fine, reddish brown from

apex to middle of inner margin, marked with buff white points on veins; a diffuse fuscous brown subterminal shade outwardly edged with light brown.

Hind wings dull roseate brown at base and along iinner margin, brownish on costa; ocellus very large, black, broadly circled with whitish yellow, containing an irregular brown spot with four lines projecting towards outer margin, and an angled white line within it; a postmedial lunular black line followed by a broad maroon shade; outer margin and cilia ochreous buff, with a darker terminal line.

Fore wings below brownish buff, tinged with reddish except on costal and outer margins which are shaded with fuscous; a large black discal spot containing a small white spot; an outer black line, wavy from costa, well before apex to middle of inner margin; traces of subterminal triangular fuscous shades.

Hind wings below brownish buff irrorated with fuscous; a small horizontal whitish discal streak, dark edged; a wavy, irregular postmedial dark line; traces of subterminal shadings as on fore wings.

Ex. 95 mm.

Hab. Joinville, Brazil.

Othorene corrupta sp. n.

♂. Head, collar, and patagia dull purplish slate colour; thorax roseate brown. Abdomen above pale reddish brown.

Fore wings dull purplish slate colour at base, shading to roseate brown terminally, crossed by numerous black striae, but fewer on outer margin; no traces of lines.

Hind wings pale brown, darker shaded on costa; a purplish red shade along inner margin.

Fore wings below roseate brown, the apex striated with black.

Hind wings below yellow buff, shaded with roseate on inner margin.

Ex. 72 mm.

Hab. Joinville, Brazil.

Cicinnus maera sp. n.

♂. Head roseate brown. Collar, thorax, and abdomen pale reddish; anal tufts fuscous brown.

Fore wings to outer line pale reddish shaded with smoky grey before the line, and with a few scattered fuscous scales on postmedial space; a large round buff white spot filling end of cell, finely darker edged, especially on discocellular, which is followed by a slight fuscous grey shade; pale shades between veins 2 and 4 close to median; a fine darker red line from cell spot to inner margin; outer line remote, fine, oblique on costa, angled at vein 8, then thicker, dark

brown and vertical to inner margin, a black shade from angle above vein 8 to termen at apex, shaded above with fuscous grey; termen roseate buff shaded with pale grey, and irrorated with black, forming clusters on veins near outer line; the apex is bluntly produced, the termen somewhat convex between veins 5 and 2.

Hind wings grey shaded with roseate becoming reddish at outer line and on termen, thinly irrorated with dark scales; the outer line dark brown from costa near apex to anal angle, followed by black clusters of scales on veins.

Wings below similar but duller.

Ex. 33 mm.

Hab. Joinville, Brazil.

Titya fuscicaudata sp. n.

♀. Body dull brown; anal tufts fuscous brown.

Fore wings smoky brown, thinly scaled, the lines broad, greyish buff; antemedial inwardly oblique. inbent at submedian; an oblique black spot on discocellular; postmedial inbent, sinuous; subterminal narrower, parallel with postmedial.

Hind wings smoky brown; a broad, slightly darker, medial shade.

Ex. 58 mm.

Hab. Rio Grande do Sul, Brazil.

The types of these species will be placed in the United States National Museum at Washington.

The Genera Parotermes and Hodotermes (Isoptera).

By T. D. A. Cockerell, Boulder, Colorado.

At Station 14, in the miocene shales of Florissant, Colorado, my wife found a specimen of *Parotermes fodinae* Scudder, sufficiently well preserved to show practically the entire venation of the anterior wings. Upon comparison, I find that the venation is nearly identical with that of *Hodotermes ochraceus* Burm., as figured by Desneux in *Genera insectorum*, Isoptera, pl. 1, f. 4a. The difference is mainly as follows: *P. fodinae* has the region above the media considerably narrower, so that about the middle of the wing the media is distinctly nearer to the costa than to the upper branch of the cubitus; the media (scapular vein) gives off above in my example of

fodinae three branches in one wing and four in its opposite (in *ochraceus* six); below, the media gives off three branches, the first before the origin of the third upper branch, all leaving the media at a much larger angle than the upper branches (*ochraceus* is quite different here, but *Hodotermes mossambicus* has the lower branches of the media practically as in *P. fodinae*). The cubitus forks before the middle of the wing, and its upper branch forks again, exactly as in *H. ochraceus;* the anal also has a fork below and a little beyond the cubital fork, as in *ochraceus.*

The presence of the sub-costal (sub-marginal) vein, which was supposed to separate *Parotermes* from *Hodotermes,* is not diagnostic, this vein being present in true *Hodotermes.* It is *Parotermes,* formerly considered a sub-genus of *Hodotermes,* which has the sub-costa absent or rudimentary. According to the diagrammatic figure of *Hodotermes brunneicornis* given by Redtenbacher and reproduced by Sharp, the media of that insect has no inferior branches, and the cubitus is wholly unlike that of our fossil; but *brunneicornis* really belongs to a different genus, *Stolotermes.* The indications are, then, that *Parotermes* differs little from *Hodotermes,* so that it may be a matter of opinion whether it is really separable. At the present day, *Hodotermes* is represented by five species in Africa, three in Central Asia and three other dubious forms, Asiatic and African. It therefore, in its occurrence at Florissant, affords a case parallel to those of the Nemopterids and Nemestrinids.

Scudder described a large species from the Florissant shales as *Hodotermes* (?) *coloradensis.* It is remarkable not only for its large size, but the unusually long abdominal appendages, and the total absence of the sub-costal vein on all the wings. It is therefore apparently not a true *Hodotermes.* I have a very fine specimen (Florissant, Station 13, *W. P. Cockerell*) which I have referred to Scudder's species, but on reviewing the subject I can only conclude that it is distinct, since it has the sub-costal vein well developed, and the abdominal

appendages are very small, resembling those figured by Desneux for *Hodotermes turkestanicus*. My insect is, I believe, a true *Hodotermes* or *Parotermes*, although the structure of the cubital and anal veins, and lower branches of the media, cannot be made out. It may be named as follows:

Parotermes scudderi n. sp.

Hodotermes coloradensis Cockerell, Popular Science Monthly, LXXIV, 1908, p. 118, fig.

Length about 15½ mm.; head oblong, about 4¼ mm. long and 3 wide; wings about 22 mm. long; media to costa in middle of anterior wing about 1 mm., thus the space narrow as in *Parotermes*; media of anterior wing with only three branches above, the first arising nearly 9 mm. from base of wing; radius of lower wing with two branches above; antennae, as preserved, appearing brown with white annuli (the sutures), about six joints to a mm. in middle of antenna.

Easily known from the other species of *Parotermes* by its great size.

Collecting and Mounting Micro-Diptera.

Paper II—Mounting.

By E. T. Cresson, Jr., Philadelphia, Pa.

In previous pages of this journal (1) I gave an account of a method of collecting micro-diptera and promised to supplement it with an article on a method of mounting which I use and find most satisfactory for preserving them for study. It is generally the fact that a thorough systematist is a poor technician and *vica versa*. The systematist being more interested in the insect and its relationship than in the method of mounting and its appearance in relation to others in the series or collection, while the technician considers more the appearance and the method of mounting. The method I use and will here try to describe, should appeal to the former on account of the advantages possessed for thorough examination, while the appearance of the mount and its subject should satisfy the latter

The common practice of gluing the insect to points, which is usually done by Coleopterists and seems most satisfactory for them, should be discouraged for micro-diptera, and this

(1). Vol. xxi., pp. 406-410.

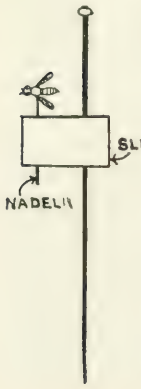
I do most earnestly on account of two very bad features which are evident even when most care is taken in the mounting. This I say in spite of what Prof. C. F. Baker says in his article "On Mounting Minute Insects, Particularly Micro-Diptera," (2) in which he recommends gluing the specimens on cardboard points, arguing mainly from a technician's viewpoint, that the various angles which the specimens may otherwise assume, ruins the appearance of the collection. My objections to this and other methods mentioned in this paper of mine, are based upon experience in handling a great mass of material on all sorts of mounts. Regarding the objectionable features of the method above mentioned, the first and most important is the fact that one surface is always inaccessible for examination, and this surface may have the character of most value. If relaxing and remounting could be done, this factor would not be so objectionable. Then again in mounting with glue the legs which are often tightly folded may have to be spread for examination of the bristles, etc., and this is generally impossible on account of softening the mounting adhesive. Of course, if the adhesive used is soluble in water this factor is eliminated. The other fault in question is that it is often the case when certain characters are to be examined, the large pin interferes with the line of vision. There still remains another fault which can be eliminated and that is the practice of picking the insect up with a moist point or brush in order to place it on the mount. Then again, the moisture from the mounting adhesive will often discolor the insect beyond recognition, thereby rendering the specimen worthless. I have in mind a case where a new species was practically based upon the discoloration caused by the stain resulting from the moisture in the adhesive used in mounting. In handling these small insects, I always use tweezers, picking them up by the wings or, secondly (rarely), by the legs, never, under any circumstances, touching the body with anything other than the point of the mounting pin. As emphasized in

(2). Psyche, May 1897, pp. 63-64.

my previous article, an excess of moisture is the greatest enemy one has to guard against in handling these small insects.

Another method which is also used, and although better than the one just discussed, has one of the former objections besides another, not so important, but still a factor to be considered. I refer to the method of mounting the insect the usual way on a minute nadel which is, in turn, stuck into a piece of cork, pith, or similar substance, and this mounted on a standard pin, thus forming what is termed a secondary mount, the method to which Prof. Baker refers as being unsightly. The first objection to this method is the necessity of handling the insect in the act of piercing it with the nadel, although this can be done to some satisfaction by placing the specimen on cloth or pith. The other objection is that the nadel in piercing the thorax will often depress or break the chitin and thereby destroy the normal position of an important bristle or hair.

The method I use also comes under the head of secondary mounting, but overcomes all the objections noted above. This I will try to explain as clearly as possible, and the process, although appearing long and complicated, is quite simple, and the satisfaction gained by having thoroughly practical mounts will offset any extra time spent. This method is practically the impaling of the insect upon the point of a nadel, which is supported by a cork, pith or blotting paper mount on a standard pin in the manner shown by the accompanying sketch. There are several ways in which this can be done and various kinds of supporting materials used, but I find that blotting paper is the most economical and looks neat. I generally prepare the slips of blotting-paper in quantity, using the thickest blotter I can find (40 pounds to the ream). A standard sheet will supply enough slips for a season's collecting. These slips are cut 5 x 9 millimeters in size, on a photo-trimmer with the aid of a couple of



gauges. The nadeln (I use the American Entomological Co.'s No. 216) are first arranged in a flat bottom tubular vial, whose diameter is less than the length of a nadel, with their points up. This can be done any time, and is to me the most tedious part of the entire proceedings. I throw two or three hundred upon a piece of white cardboard, which at once shows up the pointed ends, and with a pair of fine tweezers I pick each one up and drop it into the vial with its point up. The standard pin is No. 2, steel or hard brass, 39 millimeters long. The foregoing operations are all preparatory and can be done in sufficient quantities to take care of the season's collecting. Preparatory to the actual mounting a goodly number of slips must be pierced through one end by a nadel. Any quantity of these may be prepared, and are best arranged in series, sticking in a sheet of cork or pith. The nadeln are gotten out of the vial by inverting the latter against the thumb of the left hand and pinching a few of the nadeln between the thumb and index finger, and with the forceps each nadel is taken and stuck in a sheet of cork. After a goodly number are thus treated they are then pierced through the slips, and these are arranged as above suggested, thus completing all the operations preparatory to the actual mounting. The following equipment will be found necessary for rapid work; a pair of pinning forceps, a low power (1½ inch focus) watchmaker's eye lens with spring, a gauge, for making the slips of uniform height on the supporting pin (22 millimeters up from the point), and a sheet of white bristol board or blotting-paper.

The insects to be mounted are thrown, a few at a time, upon the white bristol board, a nadel with its accompanying slip is picked up with the forceps, and, with the aid of the magnifying glass, pierced through the *side* of the thorax, preferably the left side. A click will be heard as the nadel is pulled up, thus indicating that the point has passed through the thorax. Then, with the aid of the other hand, invert the slip and grasp the same with the forceps at the nadel end and pass a standard pin through the other end in the opposite direc-

tion to that of the nadel, but not too close to the end. Reference to the figure will more fully explain this. This finishes the actual mounting and by the use of the gauge, the slip can be run up on the large pin to the given distance, thus making uniform mounts. Finally, by the application of a drop of diluted white shellac at the junction of the slip and the large pin, a very rigid mount is obtained, leaving the nadel free to turn, as is often necessary to present certain aspects for examination. With relaxed specimens, after the same have been dried, a blotter should be used instead of the bristol board so that the point of the nadel can protrude further through the thorax. This will insure a more solid mount, as the body juices are not present to cement the specimen to the pin.

These mounts have a very neat, uniform appearance, and the method, although seemingly rather complicated and lengthy, is very simple, and after a little practice becomes very easy, and one can mount as rapidly as with any other double-mounting method. This method insures as perfect specimens as is possible, and gives access to any surface for examination with a compound microscope, and although it has been used before, I do not see many examples in the collections I have examined. It should be used by all who mount small Diptera, and when one collects by sweeping, the material is often gathered in such large numbers that one needs a rapid and safe method for mounting the same.

Notes on the Phototropism of Certain Mosquitoes (Dipt.).

By Harry B. Weiss, New Brunswick, N. J.

The different species of mosquitoes exhibit quite dissimilar reactions with regard to their avoidance of and attraction to sunlight. Some are apparently both equally positively and neg-

atively phototropic, while others respond mainly only to one stimulus and again others are unequally positively and negatively phototropic.

Culex pipiens, Culex aurifer, Culex canadensis, Culex sylvestris, Culex salinarius, Anopheles maculipennis and *Wyeomyia smithii* are negatively phototropic. They appear normally only at night. They are also slightly positively phototropic inasmuch as they are attracted to a certain extent by artificial light and the low intensities found at dusk. In other words these species are positively phototropic up to a certain intensity of light, when they become negatively phototropic.

Near the close of the season impregnated females of *pipiens* becomes strongly negatively phototropic and seek dark hibernation quarters in spite of the warm temperatures, which sometime prevail outside. *Anopheles crucians,* sometimes called the daylight mosquito, is positively phototropic up to the high intensity of light which occurs during the middle of the day. *Anopheles punctipennis* responds both negatively and positively, more so negatively. Its normal attraction is a low intensity.

Culex sollicitans seems to be equally negatively and positively phototropic, these tropic reactions evidently being dependent upon nutrition, as it is difficult to find a more bloodthirsty species. *Culex perturbans* is negatively phototropic and *cantator* positively, but not to the extent of *sollicitans.*

Positive phototropism is most prevalent among the salt marsh forms, *Culex sollicitans, Culex cantator* and *Culex taeniorhynchus* all actingly positively but *Culex salinarius,* which is also a salt marsh mosquito, responds negatively.

Inasmuch as various factors influence phototropism, it might be supposed that the positive reactions of *sollicitans, cantator* and *taeniorhynchus,* all being biters of the first rank, are dependent upon their desire for food. Positive phototropism is not at all useful to mosquitoes inasmuch as it subjects them to attacks by their natural enemies.

The Effect of Temperature on the Molting of the Walking-stick, Diapheromera femorata Say (Orthop.).

By Henry H. P. Severin, Ph.D., Honorary Fellow, University of Wisconsin, and Harry C. Severin, M.A., Professor of Entomology, South Dakota State College of Agriculture and Mechanic Arts.

In a recent paper we (1) called attention to the fact that of one hundred *Diapheromera femorata* reared under as nearly normal or field conditions as possible during June, July and August, the months during which the development of this Phasmid occurs in its natural habitat in Wisconsin, 23 per cent. molted four times, 76 per cent. five times, and only 1 per cent. six times. The suggestion was also made that "in all probability temperature plays an important role in the rate of development." To determine with certainty what effect temperature has on the molting of this walking-stick, a number of experiments were performed.

In order to compare the data obtained by rearing some of these insects under normal conditions with specimens bred under a temperature either higher or lower than field conditions, the following table containing the averages of the intervals or periods between molts (stages or stadia) and the total duration of the periods (post-embryonic development) of five

TABLE I.

AVERAGES IN DAYS OF THE STAGES BETWEEN MOLTS OF DIAPHEROMERA FEMORATA REARED UNDER NEARLY FIELD CONDITIONS IN JUNE, JULY AND AUGUST.

Sex	Number of molts	Stadium I	Stadium II	Stadium III	Stadium IV	Stadium V	Stadium VI	Post-embryonic development
♂	4	12.6	7.6	10	10.4			40.6
♂	4	13.8	9.4	9.6	8.6			41.4
♀	5	9.8	8	8.2	9.8	11		46.8
♀	5	11.6	8.4	8.8	9.2	11.4		49.4
♀	6	8	7	9	8	9	12	53

males and five females which passed through four molts, of five males and five females which passed through five molts, and of one female which molted six times, is copied from a previous paper (1).

Five specimens of *Diapheromera femorata* were reared at a high but not constant temperature. In this experiment, the walking-sticks were bred above a paraffine oven, the temperature in this region varying between 25 and 35 degrees C. The following table shows the interval, in days, between molts and the total duration of the stadia.

TABLE II.

STAGES IN DAYS BETWEEN MOLTS OF DIAPHEROMERA FEMORATA REARED UNDER A HIGH TEMPERATURE OF 25° TO 35° C.

Date of Hatching	Sex	Number of Molts	Stadium I	Stadium II	Stadium III	Stadium IV	Stadium V	Stadium VI	Post-embryonic development	Date of Last Molt
May 4, 1910	♂	5	7	7	6	9	8		37	June 10
" " "	♂	5	12	7	10	7	8		44	" 17
Averages			9.5	7	8	8	8		40.5	
May 3, 1910	♂	6	12	7	8	7	7	7	48	" 20
" 16, "	♂	6	9	8	7	6	7	9	46	July 1
Averages			10.5	7.5	7.5	6.5	7	8	47	
May 13, 1910	♀	6	10	10	7	7	7	9	50	" 2

A glance at the averages of the post-embryonic developments in the following table shows that the male walking-sticks which passed through four molts under nearly normal conditions required about the same amount of time (40.6 days) as the male specimens which molted five times under a high temperature (40.5 days). Practically the same results were obtained with the male and female Phasmids which passed through five molts under nearly normal conditions, and six molts under a high temperature (Table III). If the averages of corresponding stadia of the male individuals which molted four and five times under a nearly normal and a high tem-

perature are compared in the following table, it is seen that the interval between molts is considerably shorter under a high temperature. The same is true, with two exceptions, of the male and female walking-sticks which passed through five molts under nearly normal conditions and six molts under a high temperature (Table III).

One would not hesitate to conclude from these results that *a high temperature shortens, on an average, the interval between molts.*

TABLE III.

AVERAGES IN DAYS OF THE STAGES BETWEEN MOLTS OF DIAPHEROMERA FEMORATA REARED UNDER NEARLY NORMAL CONDITIONS AND A HIGH TEMPERATURE OF 25° TO 35° C.

Temperature	Sex	Number of Molts	Stadium I	Stadium II	Stadium III	Stadium IV	Stadium V	Stadium VI	Post-embryonic development
Normal	♂	4	12.6	7.6	10	10.4			40.6
High	♂	5	9.5	7	8	8	8		40.5
Normal	♂	5	9.8	8	8.2	9.8	11		46.8
High	♂	6	10.5	7.5	7.5	6.5	7	8	47
Normal	♀	5	11.6	8.4	8.8	9.2	11.4		49.4
High	♀	6	10	10	7	7	7	9	50

De Sinéty (2) reared a walking-stick, *Leptynia attenuata,* at 30 degrees C. and found that, while the specimen completed its development more quickly under these conditions, yet the acceleration in development did not affect the interval between the four molts equally. He writes, "tandis que le premier est peu abrégé, le deuxième et le troisième le sont beaucoup et le quatrième est allongé."

In another experiment, ten male and five female walking-sticks were reared during the somewhat colder months of April, May and the early part of June. The following table shows the interval between molts and the post-embryonic development of each group of walking-sticks, the grouping being made according to sex and the number of molts.

If the averages of the post-embryonic developments of the male walking-sticks which molted five times under nearly normal conditions are compared in the following table with those of the male specimens that passed through four molts while exposed to a low temperature, it will be seen that the former

TABLE IV.

STAGES IN DAYS BETWEEN MOLTS OF DIAPHEROMERA FEMORATA REARED DURING THE SOMEWHAT COLDER MONTHS OF APRIL, MAY AND THE EARLY PART OF JUNE.

Date of Hatching	Sex	Number of Molts	Stadium I	Stadium II	Stadium III	Stadium IV	Stadium V	Post-embryonic development	Date of Last Molt
April 8, 1910	♂	4	14	12	10	14		50	May 28
" " "	♂	4	16	10	8	11		45	" 23
" 11, "	♂	4	14	8	8	16		46	" 27
" 14, "	♂	4	12	10	10	14		46	" 30
" 16, "	♂	4	13	9	11	15		48	June 3
Averages			13.8	9.8	9.4	14		47	
April 5, 1910	♂	5	15	9	8	12	14	58	June 2
" 10, "	♂	5	16	10	9	11	13	59	" 8
" 11, "	♂	5	13	8	9	12	15	57	" 7
" 11, "	♂	5	14	10	8	11	13	56	" 6
" 18, "	♂	5	11	10	10	12	12	55	" 12
Averages			13.8	9.4	8.8	11.6	13.4	57	
April 9, 1910	♀	5	15	8	10	11	14	57	June 5
" " "	♀	5	17	9	8	10	14	58	" 6
" 10, "	♀	5	17	9	8	12	12	57	" 6
" 12, "	♀	5	14	9	8	13	13	57	" 8
" 23, "	♀	5	11	9	10	12	11	53	" 15
Averages			14.8	8.8	8 8	11.6	12.8	56.4	

required about the same amount of time (46.8 days) as the latter (47 days). The female, which under nearly normal conditions cast its skin six times, required 53 days to complete its post-embryonic development, while the females which molted five times, while kept in a cold temperature, required

56.8 days (Table V). A comparison of the averages of corresponding stadia of the male and female Phasmids which were subjected to differences in temperature, shows that the interval between molts is longer on an average when the insects are kept in a cold temperature. It is evident, thus, that *a low temperature lengthens, on an average, the interval between molts.*

TABLE V.

AVERAGES IN DAYS OF THE STAGES BETWEEN MOLTS OF DIAPHEROMERA FEMORATA REARED UNDER NEARLY NORMAL CONDITIONS IN JUNE, JULY AND AUGUST, AND IN THE SOMEWHAT COLDER MONTHS OF APRIL, MAY AND THE EARLY PART OF JUNE.

Temperature	Sex	Number of Molts	Stadium I	Stadium II	Stadium III	Stadium IV	Stadium V	Stadium VI	Post-embryonic development
Normal	♂	5	9.8	8	8.2	9.8	11		46.8
Low	♂	4	13.8	9.8	9.4	14			47
Normal	♀	6	8	7	9	8	9	12	53
Low	♀	5	14.8	8.8	8.8	11.6	12.8		56.8

It is apparent that the effect of temperature on the duration of the stages, and the influence of temperature in determining the number of molts, are two entirely different problems. To ascertain what effect temperature has on the number of molts that the walking-stick undergoes, the following table should be examined:

An examination of Table VI shows that of the five specimens reared under the high temperature, three molted six times and not a single individual four times; also, of the fifteen Phasmids that were kept at the low temperature, five molted four times, ten five times, and not a single specimen six times. While the number of *Diapheromera* kept at the low and high temperatures is not exceedingly large, still these results show that *a high temperature has a tendency to increase the number of molts, while a low temperature decreases the*

number. In a previous paper (1) attention has already been called to the fact that "we have reared a number of *Diapheromera* which were hatched on the same day, fed with the same kind of food and kept in the same breeding cages throughout their entire life history under exactly the same kind of condi-

TABLE VI.

PER CENT. OF MALE AND FEMALE DIAPHEROMERA FEMORATA WHICH MOLTED FOUR, FIVE OR SIX TIMES UNDER THE DIFFERENT TEMPERATURES.

Temperature	Number of Molts	Number of specimens and sex	Per Cent.
High 25°–35° C.	5	2 ♂	40
	6	2 ♂, 1 ♀	60
Normal	4	18 ♂, 5 ♀	23
	5	34 ♂, 42 ♀	76
	6	1 ♀	1
Low	4	5 ♂	33⅓
	5	5 ♂, 5 ♀	66⅔

tions of temperature, and yet some specimens molted four times while others molted five times." The effect of temperature, therefore, does not alone explain these differences in the number of molts.

Summary—A low temperature lengthens, while a high temperature shortens on an average the interval between molts. A low temperature has a tendency to decrease the number of molts, while a high temperature increases the number.

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Some New and Little-known Heteroptera from the Western United States.

By J. R. de la Torre Bueno, White Plains, N. Y.

When Professor J. M. Aldrich made his Western trip last year to look for Packard's *Ephydra californica,* he most kindly offered to endeavor to get me some specimens of Uhler's *Gerris robustus,* originally described from Clear Lake, California. He was successful not only in his own particular quest, but also in securing the long-lost *Gerris,* and together with that a number of land forms which he most obligingly permitted me to work up for him. They follow with appropriate comment. The species, it should be noted, are typically Western with two exceptions, viz: *Harmostes reflexulus* Say and *Brochymena 4-pustulata* Fabr.

Notonecta indica Linné.

A long series from Garfield, Utah, and Lake Elsinore, California, received through Prof. J. F. Abbott, who has the Corixas, and some labelled Smaller Soda Lake, Nevada. These are very interesting habitats, as the lakes are salt or alkaline, thus tending to show that *Notonecta* is not necessarily a fresh water insect.

Acanthia xanthochila Fieb.

Lake Elsinore, California; Soda Lakes, near Hazen, Pyramid Lake, and Winnemucca Lake, Nevada; Garfield, Utah.

This is a most widespread species, and is practically Holarctic in its distribution. The twelve specimens taken at these various places are typical.

Acanthia coriacea Uhler.

Brigham, Utah. One specimen.

Acanthia polita Uhler.

Garfield, Utah. One example.

Acanthia sp. (near **saltatoria** L.).

Highland Springs Lake. Three specimens.

Gerris gillettei L. & S.

=*Limnotrechus productus* Uhler. Hem. of Colo.

One female specimen from Garfield, Utah, on brackish water. This agrees in every particular with the original description and with the type in the collection of the Colorado Agricultural Experiment Station of Fort Collins, kindly loaned to me for study by Prof. C. P. Gillette. This is the first authentic record of the species since it was first described, and serves to establish its character as a good species. Its chief superficial character separating it from *Gerris* (*Limnotrechus*) *marginatus* Say, lies in the anal cerci, which in *marginatus* are short and comparatively stout, while in *gillettei* they are long, attaining the extremity of the abdomen and comparatively slender.

Gerris robustus Uhler.

Four apterous males and one female, and one winged male and one female, from Highland Springs, California. Prof. Aldrich writes thus about the locality: "The springs that give the name to the place come out a short distance from the sanitorium, and I ran down there with my net. There are perhaps twenty springs, all carbonated that I saw, and they make quite a little stream. On this there were a few skippers, and I got half a dozen, all short winged but large. These were all I could get for you. They were collected about ten miles from Clear Lake, and as near as I can remember they were the only skippers I saw on the trip."

It may be readily seen from the preceding that while not from the very place whence Uhler got his single female type, it was sufficiently near to act as a type locality, given the wide spread of the Gerrids, which are great travelers. The winged female in *structural* characters agrees with Uhler's description, but not so in color, as I shall explain more at length elsewhere. The species is a widespread Western form, which has come into my hands from various other sources. Several of the specimens had an alkaline crystalline accretion

on the hind tibiae and tarsi, doubtless from the highly charged water on which they lived.

Rasahus thoracicus.

One specimen from Santa Monica, California.

Zelus (Pindus) occiduus n. sp.

Belongs in the sub-genus *Pindus* of Stal, which is characterized by the possession of four black spines on the thorax, two lateral and two on the disc.

Differs from *Zelus* (*Pindus*) *socius* Uhler in having the 1st and 3d joints of the antennae subequal, the first a little over three times as long as the second, and the 3d somewhat less than three times the second. Proportion of antennal joints 1st: 2d: 3d:: 50: 16: 44. Third joint in male scarcely stouter than 2d and of even diameter throughout; not tapering.

Rostrum reaching to anterior coxae; joint 2 five times as long as 1 and more than six times as long as 3. Proportions: 1st joint: 2d: 3d:: 4: 20: 3.

Hemelytra with the main corial vein whitish.

Legs slender, femora thickened and slightly darker toward the distal end; femora of first pair of legs thickest and longest; of second pair, thinnest and shortest; hind femora intermediate in thickness and length.

Proportions:—Anterior femora: middle: posterior:: 5.1 mm.-5.6 mm.: 3.6 mm.-4 mm.: 5 mm.-5.4 mm.

Head, length: 2.6-2.5 mm.; prothorax, 2.4-2.1 mm.; scutellum, 1.2-1 mm.; abdomen, length from tip of scutel; 6.8-6.4 mm.; total length, 13-12 mm.; greatest breadth (abdomen) 2.6-2.4 mm.; length: breadth:: 5:1.

Described from two males taken by Prof. J. M. Aldrich at Owen's Lake, California, July 27, 1911. Cotypes in collections of J. M. Aldrich and mine.

Lygaeus reclivatus Uhler.

Owen's Lake, California, two specimens; Pyramid Lake, Nevada, one specimen.

Lygaeus bicolor H. S.

Santa Monica, California, three specimens.

Largus convivus Stal.

Santa Monica, California, two specimens.

Harmostes reflexulus Say.

Winnemucca Lake, Nevada, one specimen.

Alydus setosus Van Duzee.

Santa Monica, California, one specimen, apparently first record since the type.

Anasa ? obliqua Uhl.

Santa Monica, California, one specimen.

Brochymena quadripustulata Fabr.

One specimen from Brigham, Utah.

Antigeny in Nearctic Butterflies (Lepid.).

By Henry Skinner, M.D., Sc.D.

Antigeny has been defined as sexual dimorphism and it has the advantage of expressing the idea in one word. Many of our butterflies show marked differences in appearance between the sexes, of a secondary sexual character, and while there have been many theories to account for these differences, none of them appear to the writer to be very satisfactory or convincing. There is a great difference among the various species as to the degree or amount of antigeny shown. In some cases it is so great that the sexes of one species have not infrequently been described as totally different species and in other cases the differences between the sexes is slight or non-existent.

Examples of marked antigeny are shown in *Argynnis diana, Neophasia terlooti, Meganostoma eurydice, Pieris amaryllis, Colias christina, Papilio turnus, Pamphila zabulon* and *hobomok* and others. If we include the Hesperidae about one seventh of the North American butterflies may be said to show antigeny. Whether these have any advantage in the struggle for existence or not, I will not discuss in this article.

In the large genus *Argynnis* there are a number of antigenetic species . . . . *diana, idalia, cybele, nokomis, leto,*

nitocris, polaris and *alberta. Cybele* is included because in some parts of its range the female is sometimes white or cream color but ordinarily the sexes are marked alike. There are no striking examples in *Melitaea* except that in *palla* there is a melanic female, as well as the tawny female. In *Synchloe adjutrix* there are two kinds of males and two kinds of females, which were formerly known as different species.

There are several good examples in the Satyridae. *Debis creola* has a number of velvety patches on the fore-wing in the male. Both sexes of *Coenonympha haydeni* were originally described from males, but there are marked differences in color between the sexes, so that they may be distinguished at a glance. *Satyrus gabbi* is another Satyrid showing sexual dimorphism.

Thecla laeta is the most marked instance in its genus. In *Lycaena* there are a number of species . . . . *heteronia, clara, fulla, pheres, antiacis, saepiolus, battoides, podarce, scudderi, acmon, pseudargiolus, comyntas, isola,* and others to a lesser degree. *L. acmon* is antigenetic, and a very closely related species *neurona* is not. Until recently the two species have been confused. Which one has the advantage over the other? The females of *neurona* are alike in appearance, being dark brown. In the genus *Chrysophanus* we have *helloides, rubidus, sirius, arota, thoe, mariposa* and *zeroe,* all showing antigeny.

In the Pieridae are a number of examples, including *Leptalis melite, Neophasia terlooti, menapia, Pieris neumoegeni, amaryllis, monuste* (often has a melanic female), *Anthocharis genutia, Catopsilia* spp. (which often have white females), *Meganostoma caesonia, eurydice. Colias* also shows antigeny in many species. *Christina* has a yellow and a white female and *C. behri* is also a good example of diversity. Perhaps the best example in *Terias* is *mexicana.*

In *Papilio* are *turnus, polyxenes, troilus* and *philenor.*

Most of the Hesperidae are distinctly antigenetic, the males being of a bright color and also have a distinct stigma, brand or sex mark. *Pamphila zabulon* has the female dark brown and

the male yellow and a close ally, *hobomok,* has two distinct forms of female.

From these many antigenetic forms, a few have been selected and their remarkable difference has been said to have been brought about through mimicking another species which is said to be nauseous to birds. Mr. W. H. Edwards has written a very interesting account of *Papilio turnus glaucus* and it may be of moment to briefly refer to what he says of it.

"Some unknown influence caused the black female form to appear as a distinct variety, and that, owing to some circumstance, it thereby gained an advantage over its rival, which caused it finally to supplant the other." There is one statement in the above that is not correct. The black female has not supplanted the other. There is also an assumption to which I take exception. Does anyone know which one appeared first and why? Many species have a black or blackish female. *Pamphila hobomok* is the exact counterpart of *turnus* as regards trimorphism. *Lycaena pseudargiolus* presents an analogous condition, only reversed, as it has two kinds of males, a black one and a blue one. This is also true in a lesser degree of *Colias philodice* which rarely has a melanic male. Mr. Edwards impartially presents both sides of the argument and my remarks are not in criticism of his article. I only use it as a text. He found no evidence that the heat of summer or the cold of winter exerts any influence in causing one or the other form of the female. He also mentions the theory of protection due to the difference in color between the females and thinks the gay color of the yellow female makes it an easier prey of birds. He elaborates on the bird theory but in relation to this it is only necessary to say that the Biological Survey has examined fifty thousand bird stomachs and only found butterflies in five stomachs. No species of butterflies have been found in the stomachs of American "Flycatchers." He further says "*Papilio philenor* has a strong disagreeable scent, and it has been suggested by Mr. Mead, that this rendering it distasteful to birds would serve to protect other black species flying with it." The dis-

agreeable scent of *philenor* is disputed by Scudder. It is interesting to know that Mr. Mead suggested this theory at that time. Mr. Edwards accounts for the scarcity of yellow females in West Virginia as due to the influence of birds.

He also says, however, that the yellow females are more numerous than the black in Georgia and Florida. Attention is also called to the fact that in certain places in the mountains of the south the black females are not found.

Jeheber* believes that *glaucus* is the result of the larva feeding on "diseased food, the leaves being sprinkled over with fine black spots and completely covered with a gummy substance." While this seems unlikely it has not been disproved.

Turnus is found from the Gulf of Mexico to the latitude of the Yukon River in Alaska and possibly still further north. If we consider the topomorph *rutulus* as the same species, and I believe it is, the species also flies from the Atlantic to the Pacific Ocean. The evidence in favor of *glaucus* being brought about by mimicry is almost nil, while the evidence against it is very considerable. The species swarms in countless thousands in the north where *glaucus* does not exist. In early July along the line of the Canadian Pacific Railway, in Ontario, I have seen the species in immense numbers, far more plentiful than I have ever observed it in the south where *glaucus* is found. The species shows a remarkable instance of trimorphism, but there are a number of cases of like character in butterflies and other insects.

As mentioned above *Pamphila hobomok* is an exact counterpart of *turnus* in this respect. The male is tawny and there is a female like the male in appearance and another female that is black or dark brown, and analogous to the dimorphic *glaucus*. There is still another remarkable example of antigeny in *Lycaena pseudargiolus,* but in this case the males are different in appearance, the one being blue and the other black. This is the only instance I recall of the males being dimorphic unless it be in the black male of *Colias philodice* that rarely occurs.

*Ent. News. Vol. 16, p. 111, 1905.

Strange to say the black male of *pseudargiolus* is found in about the same territory as *glaucus* and this would make one think that it was also climatic in origin. The comparative absence of *glaucus* in the mountains and also north of latitude 43 would also indicate a climatic influence.

What is the cause of the extraordinary antigeny seen in *Neophasia terlooti?* The male in this species is white and the female orange. The female of the species was once sent to me as a "little *Danais*" and it really looks like one. Here would be a good opportunity to build up a mimicry theory. Who can tell the true meaning of antigeny among insects? There has not been put forth a single explanation that has stood any logical analysis. In regard to the black male of *Lycaena pseudargiolus* one would think that if it were produced by mimicry and so wonderfully protected that it would be more plentiful in the range of the species where it is found.

If the mimetic origin of antigenetic species accounts for them it would seem logical to think that in time all species will become dimorphic. At present, however, I see no reason for believing that the antigenetic species have any advantage over those having similar appearing sexes. The females are protected by the great difference of habit in many of them. This is shown in *Ornithoptera brookeana,* in many species of *Argynnis,* and in other butterflies. This is also well illustrated in our collections where the males of species of butterflies greatly outnumber the females. This comes from the difference in habit of the females. Is it logically correct to build up mimicry theories to explain antigeny in a few butterflies and ignore equally as well marked cases of antigeny in other species?

Change of Address.

Prof. C. F. Baker, of the Department of Biology of Pomona College, has resigned to accept a professorship in the University of the Philippines. He will be located at the College of Agriculture Los Banos, Philippine Islands. He is accompanied by his Cuban collector, Julian Valdez.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., JANUARY, 1913.

As the New Year opens and the winter season gives some respite from field work, and perhaps some leisure to think over plans for the future, some of our readers may find helpful suggestions in the following sentences, even though now nearly two years old, from Professor Gerould:

A rich field for conquest awaits any one who chooses to leave the beaten tracks of entomology and scout among the fastnesses of experimental evolution. When one considers the remarkable results that have been accomplished single-handed by such observers as Standfuss, Tower, Doncaster and T. H. Morgan, not to mention many others, the possibilities achieved in this field if the huge army of observers already interested in insects should attack in an organized way the problems of variation, the inheritance of acquired characters, mutation and natural selection, polymorphism and sex, mimicry and protective resemblance, can hardly be overestimated. Desultory observations of the strolling naturalist will not help much in this conquest, but long-continued breeding of carefully selected strains under well-controlled conditions cannot fail to win valuable results.

Entomological societies and journals of the future, in order to contribute effectively to the real advancement of science should organize co-operative plans of research along these lines and enlist the services of the countless observers whose random notes now fill their archives.—(*Science*, February 24, 1911, page 310).

Those who make use of the Entomological Literature will notice a few changes which the compilers thought to be advantageous. Beginning with this issue, papers treating of the Arachnida and Myriopoda will be included, and further, the papers of a purely or partially systematic nature will be grouped separately at the end of their respective classes or orders. These changes, we hope, will be to the advantage of those who have use for this section of our journal.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Color of Hemiptera.

The bright coloration of most Hemiptera is due to a fatty tissue known as pseudovitellus, and this tissue invades the developing egg at an early stage of maturation. . . . Dr. Buchner, "Studien an intracellularen Symbionten" (part 1., Archiv f. Protistenkunde, vol. xxvi, 1912), has taken up the detailed study of the range and nature of this form of symbiosis, and he gives a very interesting and well-illustrated account of his recherches. (*Nature,* Oct. 17, 1912, p. 197.)

The Insects' Homer.

Under the heading of the "Insects' Homer" Mr. Maurice Maeterlinck directs attention in the September issue of *The Fortnightly Review* to a little-known work by J. H. Fabre, in ten volumes, entitled "Souvenirs entomologiques." . . . In these volumes, from which copius extracts are given, Fabre recorded the results of fifty years of observations, study and experiment on a number of insects, including wasps and wild bees, certain gnats, flies, beetles, and caterpillars.

(*Nature,* Oct. 17, 1912, p. 196)

Caterpillars and the Weather.

[The Entomologist of the Utah Agricultural College Experiment Station, Mr. E. G. Titus, sends the copy of the following letter received in his Station correspondence.]

"1 Nov. 1912. I would like to know if in your opinion the presence of a very unusual number of caterpillars this fall has any bearing on the weather, either past or future.

We have had a cold and wet spring and an early and wet fall here this year. Do you think the presence of caterpillars is beneficial or detrimental to the soil? G. M."

Feltia venerabilis arida n. subsp. (Lepidop.)

Male differs from typical *venerabilis* by the very white patagia, contrasting with the dark collar; yellowish-white abdomen; creamy-white ground color of anterior wings, the dark markings contrasting; and the white hind wings. Holland's figure 26, pl. XXII. in the Moth Book, is an approach to *arida*, agreeing in the general color of the wings, but our moth is paler, and the abdomen and collar differ. The type of *arida* from Boulder, Colorado, end of September, 1912, has been placed in the U. S. National Museum.—T. D. A. COCKERELL.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues, which are generally dated the year previous.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

4—The Canadian Entomologist. **5**—Psyche, Cambridge, Mass. **7**—U. S. Department of Agriculture, Bureau of Entomology. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **10**—Nature, London. **11**—Annals and Magazine of Natural History, London. **22**—Zoologischer Anzeiger, Leipzig. **35**—Annales, Societe Entomologique de Belgique. **37**—Le Naturaliste Canadien, Quebec. **38**—Wiener Entomologische Zeitung. **40**—Societas Entomologica, Zurich. **46**—Tijdschrift voor Entomologie. **79**—La Nature, Paris. **84**—Entomologische Rundschau. **89**—Zoologische Jahrbucher, Jena. **97**—Zeitschrift fur wissenschaftliche Zoologie, Leipzig. **109**—Proceedings, Royal Society of Queensland, Brisbane. **119**—Archiv fur Naturgeschichte, Berlin. **159**—Bollettino, Laboratorio di zoologia generale e agraria della R. S. Superiore d'Agricoltura in Portici. **166**—Internationale Entomologische Zeitschrift, Guben. **175**—Aus der Natur, Berlin. **190**—Deutsche Entomologische Zeitschrift "Iris," Dresden. **193**—Entomologische Blatter, Cassel. **198**—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. **211**—Popular Science Monthly, Lancaster, Pa. **217**—Bulletin, Societe Entomologique

d'Egypte. **220**—New Jersey Agricultural Experiment Station, New Brunswick. **223**—Broteria, Revista de Sciencias Naturaes do Collegio de S. Fiel. (Ser. Zoologica). **238**—Annales, Sociedad Cientifica Argentina, Buenos Aires. **240**—Maine Agricultural Experiment Station, Orono. **244**—Zeitschrift, Induktive Abstammungs und Vererbungslehre, Berlin. **273**—Proceedings, Royal Physical Society...., Edinburgh. **276**—Bulletin, Societe Lepidopterologique de Geneve. **324**—Journal of Animal Behavior, Cambridge, Mass. **364**—Biologica, Journal Scientifique du Medecin, Paris. **365**—Collections Zoologiques du Baron Edm. de Selys Lonchamps, Bruxelles. **368**—The Monthly Bulletin of the State Commission of Horticulture, Sacramento, Cal. **369**—Entomologische Mitteilungen, Berlin-Dahlen. **381**—Experiment Station Record, Washington, D. C. **399**—Proceedings of the Cambridge Philosophical Society, Cambridge, England. **400**—Die Fauna der deutschen Kolonien, Berlin. **401**—Catalogue of the Lepidoptera Phalaenae in the British Museum, London. **402**—University of California Publications in Zoology, Berkeley, Cal. **403**—Country-Side, a Monthly Magazine Devoted to Nature, London. **404**—Report of the Quebec Society for the Protection of Plants. **405**—University of Toronto Studies, Biological Series. **406**—Boletin del Museo Nacional de Chile, Santiago de Chile. **407**—Journal of Genetics, Cambridge, England. **408**—Dominion of Canada Department of Agriculture Experimental Farms, Division of Entomology, Ottawa.

GENERAL SUBJECT. Amans, Dr.—En flanant, Causeries d'aviation, **79,** xl, 386-390. **Anon.**—Economic entomology, **381,** xxvii, 355-361, 452-460. **Anon.**—Kurzer bericht ueber den verlauf des 6. Sachsischen entomologentages in Chemnitz, **84,** xxix, 134. **Anon.**—Myases et resistance des mouches. La respiration des insectes. La cigale de 17 ans, **364,** ii, 314-316. **Aulmann, G.**—Die schadlinge der kulturpflanzen. Heft 4. Die schadlinge der baumwolle, **400,** v, 1-166. **Bervoets, R.**—Note preliminaire sur le vol des insectes, **35,** lvi, 348-350. **Braun, M.**—Das mitteldarmepithel der insektenlarven wahrend der hautung, **97,** ciii, 115-169. **Brocher, F.**—Recherches sur la respiration des insectes aquatiques (imagos), Nepe, Hydrophile, Notonecte, Dyticides, Haemonia, Elmides, **407,** xxvii, 91-93 (cont.). **Brues, C. T.**—Insects as agents in the spread of disease, **211,** lxxxi, 537-550. **Courvorsier, L. G.**—Einige gedanken ueber typen, stammformen, varietaeten, subspezies, rassen und aberrationen, **369,** i, 354-363. **Daugherty & Daugherty.**—Principles of economic Zoology. W. B. Saunders Co., Phila., 1912, 410 pp. **Fraser, W. P.**—The economic importance of land birds, **404,** iv, 44-55. **Fyles, T. W.**—Our insect and other allies, 404, iv, 28-32. **Glaser, R. W.**—A contribution to our knowledge of the function of

the oenocytes of insects, **198,** xxiii, 213-224. **Hewitt, C. G.**—The international congress of entomology, **4,** 1912, 343-346. **Hoffmann, F.**—Ein empfehlenswerter billiger zuchtapparat fur winterzuchter, **84,** xxix, 137-138. **Lochhead, W.**—Insects injurious to farm, garden and orchard crops, **404,** iv, 71-95. **L. C. M.**—The biology of the fig-tree and its insect guests, **10,** xc, 310-311. **McFarland, J.**—Biology: general and medical. W. B. Saunders Co., Phila., 1910, 440 pp. **Morley, C.**—The cause of "humming in the air," **8,** 1912, 259-262. **Popenoe, C. H.**—Insects injurious to mushrooms, **7,** Circ. 155, 10 pp. **Sanderson & Jackson.**—Elementary Entomology. Ginn & Co., 1912, 372 pp. **Steche, O.**—Die "sekundaren" geschlechtscharaktere der insekten und das problem der vererbung des geschlechts, **244,** vii, 284-291. **Turner, C. H.**—Literature for 1911 on the behavior of spiders and insects other than ants, **324,** ii, 380-399. **Weiss & Patterson.**—Nursery insects, **220,** Circ. 15, 29 pp.

Meyrick, E.—On impossible specific names, **8,** 1912, 253-255.

ARACHNIDA, ETC. Foa, A.—Movimenti degli ovidotti e conseguente metabolia delle uova negli Acaridi, **22,** xl, 341-345. **Harvey, W.**—Book scorpions in captivity, **403,** iv, 432-438. **Ivanic, M.**—Ueber die lungenentwicklung bei dipneumonen araneinen, **22,** xl, 283-289.

MYRIOPODA. Porter, C. E.—Introduccon al esludio de los miriopodos: 1. Catalogo de las especies chilenas, **406,** iv, 16-68. Catalogo de las especies espuestas al publico en la seccion de invertebrados (escluidos los insectos) del museo nacional, **406,** iv, 110-113 (cont.).

APTERA AND NEUROPTERA. Campion, F. W. & H.—The feeding habits of scorpion-flies (Panorpidae), **9,** 1912, 321-322. **Roy, E.**—La ponte des libellules, **37,** xxxix, 49-52. **Russell, H. M.**—The bean thrips (Heliothrips fasciatus), **7,** Bul. 118, 49 pp.

Evans, W.—Note on Mallophaga from the Little Auk or Rotchie (Alle alle) with list of species taken on birds and mammals in the Forth area, **273,** xviii, 265-276. **Navas, L.**—Neuropteros nuevos de America (cont.). Ascalafidos Sudamericanos, **223,** x, 194-233. **Ris, F.**—Libellulinen 6. Catalogue systematique et descriptif, **365,** Fasc. xiv, 701-836. **Silvestri, F.**—Nuovi generi e nuove specie di Campodeidae (Thysanura) dell'America settentrionale, **159,** vi, 25. Tisanuri finora noti del Messico, **159,** vi. 204-221. **Walker, E. M.**—The No. American dragon flies of the genus "Aeshna," **405,** No. 11, 213 pp.

ORTHOPTERA. Brindley, H. H.—The proportions of the sexes in "Forficula auricularia," **399,** xvi, 674-679. **Bryant, H. C.**

—Birds in relation to a grasshopper outbreak in California, **402,** xi, 1-20. **Glaser, R. W.**—Note on a pink locustid, **5,** xix, 159. **Guerin, R.**—Procede biologique de destruction des sauterelles, **79,** xl, 341-343. **Karny, H.**—Ueber die reduktion der flugorgane bei den O. Ein beitrag zu Dollo's Irreversibilitatsgesetz, **89,** xxxiii, 27-40. **Regen, J.**—Experimentelle untersuchungen ueber das gehor von "Liogryllus campestris," **22,** xl, 305-316. **Caudell, A. N.**—Notes on the mantid genus "Gonatista," **5,** xix, 160-162.

HEMIPTERA. Chapais, J. C.—The New York plum scale (Lecanium cerasifex) in Quebec, **404,** iv, 60-63. **Klodnitski, I.**—Beitrage zur kenntnis des generationswechsels bei einigen Aphididae, **89,** xxxiii, 445-520. **Mann, W. M.**—A protective adaptation in a Brazilian membracid, **5,** xix, 145-147. **Patch, E. M.**—(See below.)

Breddin, G.—Zwei neue neotropische Pentatomiden-gattungen, **119,** Abt. A, H. 6, 90-93. Hemiptera tria Neotropica, **369,** i, 351-354. **Patch, E. M.**—Elm leaf curl and woolly apple aphid (Schizoneura americana and lanigera), **240,** Bul. 203, 236-258. **Sasscer, E. R.**—Catalogue of recently described Coccidae—IV, **7,** Tech. Ser. 16, 83-97. **Van Duzee, E. P.**—Synonymy of the Provancher collection of Hemiptera, **4,** 1912, 317-329.

LEPIDOPTERA. Andres, A.—Note sur un ravageur de la noix du Cotonnier (Gelechia gossypiella) nouveau pour l'Egypte, **217,** 1911, 119-123. **Dewitz, J.**—Ueber die entstehung der farbe der kokons gewisser L. (Lasiocampa quercus), **22,** xl, 396-399. **Doncaster, L.**—The chromosomes in the oogenesis and spermatogenesis of "Pieris brassicae" and in the oogenesis of "Abraxas grossulariata," **407,** ii, 189-200. **Edelsten, H. M.**—Notes on the life-histories of "Tapinostola concolor" and "T. hellmanni," **9,** 1912, 285-287. **Hudson, G. V.**—Notes on semi-apterous females in certain species of L., with an attempted explanation, **8,** 1912, 269-272. **Hyslop, J. A.**—The alfalfa looper (Autographa gamma californica) in the pacific northwest, **7,** Bul. 95, 109-118. **Kopec, S.**—Ueber die funktionen des nervensystems der schmetterlinge wahrend der successiven stadien ihrer metamorphose, **22,** xl, 353-360. **Linstow, Prof.**—Zur anatomie und physiologie der puppen unserer macrolepidopteren, **166,** vi, 199-200 (cont.). **Lochhead, W.**—The browntail moth (a pest threatening Quebec), **404,** iv, 33-34. **Pictet, A.**—Rechercher sur le nombre de mues subies par les chenilles de "Lasiocampa quercus," **276,** ii, 80-89. La variation des L. par melanisme et albinisme des differentes parties de l'aile, **276,** ii, 104-141. **Schulze, P.**—Eine tagfalterraupe mit pedes spurii coronati, **22,** xl, 293-294.

Cockerell, T. D. A.—Notes on Seitz's "Macrolepidoptera of the World," **9,** 1912, 322-323. **Courvoisier, Dr.**—Zur nomenklatur der "Lycaena Argus" gruppe, **166,** vi, 213-215 (cont.). **Giacomelli, E.**—Lepidopteros Riojanos nuevos o poco conocidos, **238,** lxxii, 19-40. **Hampson, G. F.**—Catalogue of the Noctuidae in the collection of the British Museum, **401,** xi, 689 pp. **Reverdin, J. L.**—Notes sur le genre "Hesperia," **276,** ii, 141-172. **Schaus, W.**—New species of Heterocera from Costa Rica—XVIII, **11,** x, 509-532. **Schrottky, C.**—Zwei neue Syntomiden von Nord-Argentinien, **190,** 1912, 166. **Winn, A. F.**—A preliminary list of the insects of the province of Quebec, **404,** Suppl. to IV, 103 pp. **Woodworth, C. W.**—Check list of California insects, III. L. (continued), **368,** i, 914-919.

DIPTERA. Colledge, W. R.—Notes on a brush-tongued mosquito (of Queensland), **109,** xxiii, 121-190. **Compere, G.**—A few facts concerning the fruit flies of the world, **368,** i, 842-845, 907-911. **Hetschko, A.**—Biologisches ueber "Apistomyia elegans," **38,** xxxi, 305-307. Die metamorphose von "Liponeura cinerascens," **38,** xxxi, 319-325. **Morgan, T. H.**—A modification of the sex ratio, and other ratios, in Drosophila thru linkage, **244** vii, 323-345. **Paine, J. H.**—The yellow currant fly or gooseberry fruit fly (Epochra canadensis), **5,** xix, 139-144. The house fly in its relation to city garbage, **5,** xix, 156-159. **Rennie, J.**—Note upon a Tachinid parasite (Bucentes geniculatus) of "Tipula sp.," **273,** xviii, 231-234. **Wesche, W.**—The phylogeny of the nemocera, with notes on the leg bristles, hairs and certain mouth glands of Diptera, **198,** xxiii, 250-270.

Alexander, C. P.—New sp. of "Furcomyia" (Tipulidae), **4,** 1912, 333-343. **Enderlein, G.**—Ueber die gruppierung der Sciariden und Scatopsiden, **22,** xl, 261-282. **Johnson, C. W.**—New and interesting D., **5,** xix, 151-153. **Kieffer, J. J.**—Description de quatre nouveaux insectes exotiques, **159,** vi, 171-175. **de Meijere, J. C. H.**—Neue beitrage zur kenntnis der Conopiden, **46,** lv, 184-207.

COLEOPTERA. Blunck, H.—Das geschlechtsleben des "Dytiscus marginalis." Die begattung, **97,** cii, 169-248. **Chittenden, F. H.**—The cowpea weevil (Pachymerus chinensis), **7,** Bul. 96, 83-94. **Hochreuther, R.**—Die hautsinnesorgane von "Dytiscus marginalis," ihr bau und ihre verbreitung am korper, **97,** ciii, 1-114. **Kern, P.**—Ueber die fortpflanzung und eibildung bei einigen Caraben, **22,** xl, 345-351. **Krizenecky, J.**—Zur kenntnis der regenerationsfahigkeit der puppenflugelanlagen von "Tenebrio molitor" und einige bemerkungen...., **22,** xl, 360-369. Ueber die einwirkung des allseitigen druckes bei der puppenentwicklung von "Tenebrio

molitor," **193,** viii, 255-261 (cont.). **Urban, C.**—Zur lebensgeschichte des "Anthocomus rufus," **369,** i, 331-338.

Bickhardt, H.—Neue Histeriden, **46,** lv, 217-233. **Blatchley, W. S.**—On some undescribed forms of Florida C., **4,** 1912, 330-332. **Frost, C. A.**—Variations of "Orsodachna atra," **5,** xix, 153-156. **Heller, K. M.**—Faunistische und systematische notizen ueber russelkafer, **369,** i, 364-365 (cont.). **Nunenmacher, F. W.**—Studies amongst the Coccinellidae, No. 3 (taken by the Stanford Expedition to Brazil, 1911), **5,** xix, 149-151. **Pic, M.**—Coleopterorum catalogus, Pars 48: Anobiidae, 92 pp. **Schaeffer, C.**—The species of the coleopterous family Temnochilidae collected on the Stanford Expedition to Brazil, 1911, **5,** xix, 147-149. **Sicard, Dr.**—Descriptions d'especes et varietes nouvelles de Coccinellides de la collection du Deutsches Entomologisches Museum de Berlin-Dahlen, **119,** Abt. A, H. 6, 129-138.

HYMENOPTERA. Casteel, D. B.—The manipulation of the wax scales of the honey bee, **7,** Circ. 161, 13 pp. **Essig, E. O.**—The raspberry horn-tail (Hartigia abdominalis), **368,** i, 889-901. **Hewitt, C. G.**—The large larch sawfly (Nematus erichsonii), **408,** Bul. 10, 42 pp. **Lochhead, W.**—Bees as friends of the agriculturist, **404,** iv, 64-70. **L. C. M.**—New observations on bumble-bees, **10,** xc, 252. **Mann, W. M.**—Literature for 1911 on the behavior of ants and myrmecophiles, **324,** ii, 400-420. **de Meijere, J. C. H.**—Ueber in Equisetum parasitierende insekten, "Dolerus palustris" and "Bagous claudicans," **46,** iv, 208-216. **Zander, E.**—Die biologische eigenart der honigbiene, **175,** ix, 115-122.

Cockerell, T. D. A.—Descriptions and records of bees—XLVII, **11,** x, 484-494. **Enslin, E.**—Ueber "Tenthredo (Allantus) albiventris und trivittata," sowie ueber einige namensanderungen bei "Tenthredo" und "Tenthredella," **119,** Abt. A, H. 6, 101-105. **Friese, H.**—Neue und wenig bekannte bienenarten der neotropischen region, **119,** Abt. A, H. 6, 198-226. **Meade-Waldo, G.**—Notes on the Apidae in the collection of the British Museum, with descriptions of new species, **11,** x, 461-478. **Morley, C.**—A revision of the Ichneumonidae based on the collection in the Br. Museum. Pt. I: Ophionides & Metopiides, 88 pp. **Schmiedeknecht, O.**—Opuscula ichneumonologica, Tryphoninae, Fasc. xxxii, 2483-2562. **Strand, E.**—Ueber exotische schlupfwespen, **119,** Abt. A, Heft 6, 24-75.

REVIEWS.

The long-expected SPIDER BOOK by J. H. COMSTOCK appears as one of Doubleday and Page's series of popular Natural History books,

best known to entomologists by the Butterfly Book of W. J. Holland. In convenient size and at moderate price it well fills the place of the scarce and expensive work of McCook, published twenty years ago. The first chapters, occupying about one-eighth of the book, treat of Arachnida in general and their relations to other Arthropoda, followed by an account of the orders of segmented Arachnida and the Mites. The remainder of the book is devoted to the Araneida or Spiders proper. About a hundred pages are occupied with anatomy and general habits illustrated by instructive diagrams and detailed figures of internal organs and external parts.

A new study has been made of the male palpi which furnishes a useful key to the complications of these peculiar organs. Beginning with *Filistata* and *Eurypelma* which have a simple bulb on the end of the palpus terminating in a short tube, it passes to *Atypus* and *Pachygnatha* in which the tube is accompanied by an appendage lying parallel to it, and from these to the complicated palpi of *Linyphia* and *Epeira*. In the latter the terminal joint of the palpus is modified into a hollow "cymbium" in which the palpal organ is partly enclosed with sometimes a "paracymbium" often of characteristic form, articulated at one side. The palpal organ is here shown to consist of basal, middle and apical divisions each of which may develop chitinous appendages. The illustrations and system of names furnish means for comparing palpi of different species and in different conditions. In these studies of details the palpi were expanded and made transparent by well known methods, but it is hoped the reader will not be led to the conclusion that all palpi need to be prepared in this way for ordinary comparison.

A feature of the book is the abundance of photographic illustrations both of spiders themselves and of their webs, especially the round webs and those of the Cribellata. Particularly good are the webs of *Theridiosoma* and of *Epeira labyrinthea* and the enlarged threads of *Epeira, Amaurobius* and *Filistata*. The webs of *Linyphia* and *Theridium* are less successful but there are several good ones of *Agalena* and *Tegenaria*. The spiders were photographed from life or were killed by cyanide and then spread and photographed as soon as possible. Some of the most successful are *Herpyllus ecclesiasticus* p. 318, *Gnaphosa gigantea* on its egg cocoon p. 321, *Aranea frondosa* pp. 488 and 485, *Aranea nordmanni* p. 471, and *Argiope aurantia* p. 435. The sea of gossamer, p. 216, and the webs of *Linyphia litigiosa* p. 393, show the beautiful effects of large quantities of spider webs in the landscape. Plates have been entirely avoided and all the illustrations are distributed through the book as near as possible to the text to which they refer.

In a book intended for popular use, one of the things most to be

desired is a simple and intelligible classification, but here the author has not been able to restrain his enjoyment in the complicated and unusual. In the genus *Argiope,* for example, we have three closely related species and these are described under three different generic names while all come into the subfamily, Argiopinae. The family Argiopidae includes tthe Epeiridae in general, and the superfamily Argiopoidea all the spiders except the Avicularüidae. Even our few English names do not escape change, for "the garden spider," long a nickname of *Epeira diadematа,* is here applied to *Argiope.* There is also an unfortunate tendency to abandon names long in common use and to substitute names that are older but less certain. *Dictyna volupis,* for example, is replaced by *Dictyna foliacea* Hertz which may be any one of several species. So the familiar *Epeira insularis* is replaced by *Aranea gigas conspicellata.* Tables are used to a large extent as keys to the classification and here also the tendency is toward the complex and difficult. In the general table the reader is brought at once to such questions as whether a spider has two or four lungs, whether it has a cribellum and calamistrum or not, and whether it has two or three claws on the feet. In the descriptions of species a large amount of space is given to peculiarities of structure and habits and to nests, webs and cocoons with plently of illustrations a large part of them new and nearly all good.

References are given to other publications on American spiders of which there is a list covering seven pages at the end of the book.—J. H. E.

A Preliminary List of the Insects of the Province of Quebec. Part 1.—Lepidoptera. By Albert F. Winn, Westmount. Published as a Supplement to the Report of the Quebec Society for the Protection of Plants. 1912.

This paper consists of 103 pages and Dr. J. B. Smith's New Jersey List was adopted as a model. The distribution and date of capture are given and in some cases the species are illustrated. It is a useful contribution to our knowledge of distribution.—H. S.

Injurious Insects: How to Recognize and Control Them. By Walter C. O'Kane, Entomologist to the New Hampshire Experiment Station and Professor of Economic Entomology in New Hampshire College. The Macmillan Company, New York. Price $2.00 net.

This work contains 379 pages and 606 figures of insects of which 600 figures are stated to be original. This is really a very remarkable feature of the book after one has been accustomed to seeing the same

old cuts from the time of the father of economic entomology. Another excellent feature is that in many instances the size of the insect is given. Often in such works the novice has no way of telling how big the insect is that he sees figured. Another useful feature is the reference to the full reports on the species mentioned. The insect pests are divided into three groups. 1. Pests of garden and field crops; including all injurious species found on such plants as corn, potatoes, cucumbers, wheat, squashes and the like, also greenhouse pests. 2. Pests of orchards and small fruits, currants and similar bush fruits, and strawberries or other low-growing plants, usually designated as fruits. 3. Pests of the household, of stored products, and of domestic animals. These comprise the common injurious species that do not feed on living plants. There are chapters on structure, habits and classification; insects as carriers of disease; methods of insect control. The work is one that will undoubtedly prove of use to those who have need for such a book. The arrangement should make it possible for the novice to find the insect doing the damage, especially in view of the fact that so many species are illustrated.—H. S.

Doings of Societies.

THE PACIFIC COAST ENTOMOLOGICAL SOCIETY.

The forty-first regular meeting of the Society was held on the evening of August 19, 1911, at the Yoke Point Grill, San Francisco.

President Van Dyke in the chair. Twelve members and five guests were present. The annual election of officers took place with the following results: President, Dr. E. C. Van Dyke; Vice-President, J. E. Cottle; Secretary and Treasurer, Dr. F. E. Blaisdell.

Mr. Ehrhorn stated that Mr. Koebele was in Germany working on the horn fly problem. A communication was read from Mr. L. E. Ricksecker. President Van Dyke made some remarks on Le Conte's collecting trip to the Pacific Coast and his work about Vallecitos.

Mr. J. C. Bridwell stated that Prof. Herms was traveling in Europe, visiting collections and studying parasites.

President Van Dyke spoke about the list of butterflies of the San Francisco Peninsula published by Mr. F. X. Wil-

liams, and expressed a wish to have the lepidopterists continue it and include the entire order. He stated that the coleopterists were getting data together for a list of the entire Bay Region, a thing that he felt would be of much value. He also referred to the visit of Professors Wickham and Aldrich to this coast. Prof. Aldrich visited the several saline and fresh water lakes in Utah, Nevada and California, studying the insects which inhabit them, especially a genus of Diptera, *Ephydra*. The doctor stated that Mr. Wm. Mann at last accounts was still investigating in the barren regions of Brazil, south of the Amazon, and that he was contemplating a trip up the Amazon.

The members of the Society were pleased at having Mr. J. G. Grundel again present and recovered from his recent illness.

Mr. Chas. Fuchs reported his summer outing at St. Helena, Napa County, Calif. Mr. Cottle gave an account of his trip to the Yosemite. He stated that conditions were very unfavorable there and that snow was very abundant in June. A number of goods things were captured on Cloud's Rest, such as *Melitaea sacramenti.*

Mr. J. C. Huguenin spoke about his vacation of one week in Marin County, Calif.

Mr. J. C. Bridwell stated that collecting in the Imperial Valley was prolific of good results. In his own specialty, the Philanthidae, species were taken in considerable series and the color varied from black to ferruginous.

Mr. Ehrhorn said some interesting things about the Hawaiian fauna.

Mr. Nunenmacher stated that he had made a special effort during the last three years to study the distribution of *Omus,* and that during his trips to northern California and southern Oregon, he had discovered many interesting facts pertaining to them.

Messrs. Nunenmacher, Huguenin and Cottle exhibited a number of interesting species.

Refreshments and adjournment.

The forty-second regular meeting was held on the evening of November 25, 1911, at the Yoke Point Grill, San Francisco. President Van Dyke in the chair. Nine members and two guests were present.

Mr. Grundel exhibited numerous specimens of Coleoptera and Lepidoptera, which had been collected in the vicinity of Martinez, Calif.

Mr. Bridwell made some remarks about collecting in the Imperial Valley. *Asida, Cryptoglossa* and *Eusattus muricatus* were obtained by digging about the roots of plants; at Banning a Buprestid larva was taken from an *Opuntia* stalk. He also exhibited the work and specimens of a species of *Lyctus* seriously injuring floors and flooring of tan bark oak. Specimens of two apparently new genera of Scoliidae from southern California were shown.

Mr. Sternitzky reported a visit to Glen Allen, Eldorado County, California.

Mr. Huguenin reported some observations on the larvæ of *Halisidota edwardsii.*

Mr. Nunenmacher stated that careful collecting around the bay of San Francisco was yielding many good things, such as *Hyperaspis psyche* Casey, *H. nunenmacheri* Casey, *H. 4-oculatus* with different sized spots, *Zagloba ornatus* Horn, *Exochomus californicus* Casey, varying much in size; *Scymnus guttulatus* Lec, and *Cymatodera ovipennis* Lec. The best time for collecting Coccinellidae was stated to be late in the season—from September to the following March. They are particularly partial to a small shrub that is very abundant. As many as fifteen species have been taken at one collecting from this scrub oak-like plant.

President Van Dyke proposed the name of Prof. O. B. Johnston as an honorary member. Prof. Johnston was unanimously elected to membership. After exhibition of specimens, adjournment and refreshments.

The forty-third regular meeting was held on April 20, 1912, at the residence of Mr. J. E. Cottle, 2117 Bush St., San Francisco. President Van Dyke in the chair. Twelve members and seven guests were present.

The Secretary stated that Mr. Frank Stephens had been proposed for membership by Mr. L. E. Ricksecker. Dr. Blaisdell seconded the proposal. Mr. Stephens was elected in the usual way.

The Secretary presented a revised list of the nonorary members of the Society, as follows:

Prof. O. B. Johnston, of Seattle, Washington.

Prof. C. W. Woodworth, of the University of California.

Prof. Vernon Kellogg, of the Stanford University.

Prof. J. J. Rivers, of Santa Monica, Calif., and

Dr. L. O. Howard, of the U. S. Nat. Museum, D. C.

Mr. Nunenmacher gave an interesting talk on his studies in the Coccinellidae. These studies were mainly on the genus *Hyperaspis,* and based on *H. undulatus* as a stem-form. A diagram showing the relationships of the species was also exhibited.

Mr. Huguenin reported some very interesting observations on the habits and relations of certain species of *Lycaenae.* He stated that a colony of *L. antiacis* had been located on the slope of a hill, the area inhabited by this species being surrounded by trees and not over 100 x 7 yards in extent. *Antiacis* was found from March to April, ten to twenty specimens being taken within two hours. Six or seven *L. xerces* were also taken in that same place and at the same date. Both species were flying together. Mr. Huguenin stated that the life-histories of the species should be worked out and thus determine the relationships of the different species.

Mr. J. G. Grundel stated that he had reared three so-called species of *Alypia* from the same batch of eggs.

President Van Dyke presented to the Society a photograph received from Prof. O. B. Johnston.

A paper on the *Aleocharinae* (fam. Staphylinidae, order,

Coleoptera) from the Aleutian Islands, by Dr. A. Fenyes, was then presented and read. It was moved, seconded and voted to publish the paper.

President Van Dyke gave a talk on the relationships and distribution of the species of the Coleopterous Sub-Family, *Carabinae*.

Mr. Huguenin exhibited 180 species of insects collected at Lagunitas, Marin County, Calif.

Communications were red from Mr. Harry Lang, of Atlanta, Ga., and Mr. L. E. Ricksecker, of San Diego, Calif.

Social discussion and refreshments followed.

The forty-fourth regular meeting or Annual Field Day was held on May 19, 1912, at Lagunitas, Marin County, California. Six members and ten guests attended the outing. The day was a very rainy one and very little collecting was done. The members spent the day under cover and around a fire.

The Secretary reported a communication from Mr. Frank Stephens, to the effect that Mr. L. E. Ricksecker had been suddenly stricken and was seriously ill. The members requested the Secretary to write and express their sympathy to the family.

F. E. Blaisdell, *Secretary*.

FELDMAN COLLECTING SOCIAL.

Meeting of June 19, 1912, at 1523 South Thirteenth Street, Philadelphia; twelve members were present. President Haimbach in the chair.

Mr. Wenzel, Sr., read extracts from a letter received from our fellow-member, C. T. Greene, now located at East Falls Church, Virginia, telling how he secured the eggs of a Dipteron by placing a female in a jar with a piece of bark soaked in sap.

Mr. Geo. M. Greene exhibited the larvae, pupae and imago of *Physonota unipunctata* Say (Col.) collected by himself in Boonton, New Jersey, July 10, 1901. The envelope contain-

ing samples of the food plant disappeared so it was impossible to identify it. He had taken the first specimen of this Canadian beetle in the state hibernating, March 9, 1901, underneath a stone; this was shown. Also reported several specimens of *Calosoma willcoxi* LeC. (Col.) captured at light, Philadelphia, May 24, 1912.

Mr. Wenzel showed a large series of *Perothops mucida* Gyll. (Col.) from Twin Oak, Pennsylvania, June 13, 1912, collected on hickory; also said that *Centrodera picta* Hald. and *Chrysobothris azurea* LeC. had been taken this season locally.

Mr. Daecke said that one day while collecting at Hunter's Run, Pennsylvania, in an abandoned pass he had seen a wasp flying around and had followed it and had caught it at its nest. Both were shown, the species being *Vespa diabolica* Sauss. According to the New Jersey list, this species makes its nest under ground. Also recorded and exhibited the following: *Oryssus terminalis* Newn., *Euthera tentatrix* Loew., a rare tachina fly and *Adela ridingsella* Clem., all from Hunter's Run, May 30, 1912. He exhibited also a specimen of *Acronycta tritona* Hbn., the larva of which was taken at Lucaston, New Jersey, September 27, 1911, feeding on huckleberry, the adult emerged June 2, 1912.

Mr. Kaeber exhibited dried Russian peas; said two bags had been received from New York, one of which was about 80 per cent. infested, but all the beetles were dead, having been killed in cold storage. Specimens had been extracted and were shown. They were identified as *Bruchus quadrimaculatus* Fabr. He stated that he had noticed that *pisorun* Linn., a larger species was found in a smaller pea and only one specimen in each, while this species was smaller and several specimens were found in each pea. He was wondering if the size of the pea really had anything to do with the number of specimens found. Mr. Wenzel said it was open to doubt that the peas shown were infested in Russia as the species of *Bruchus* is found here.

Meeting of September 18, 1912, at 1523 South Thirteenth Street, Philadelphia; ten members were present. President Haimbach in the chair.

Mr. Wenzell, Sr., exhibited nests of a species of *Protapanteles* from Philadelphia Neck, September 15, from which he had bred this small wasp by the hundreds. These nests have the texture of spider webs for which he had first taken them. He also said that Mr. Green, of Easton, Wenzel, Jr., and he had taken an automobile trip to southern New Jersey the last week in June, touching at Atco, Da Costa, Hammonton, Egg Harbor, May's Landing, Tuckahoe, Cape May Court House, Anglesea, Stone Harbor, Vineland, Millville, Malaga and Willow Grove; said that the Weymouth district would be a great place for Dipterists. In the Coleoptera the regular species were found, but in general collecting was very poor. Mentioned *Tettigea hieroglyphica* Say (Hom.), saying it was frequently beaten in the net early in the morning when it seemed numb from the cold, but later in the day it could not be caught. *Cicindela abdominalis* Fabr. was mentioned among the catches and a specimen of *Dorcus parallelus* Say from the typical *brevis* district; this specimen is smaller than the smallest mentioned in Dr. Horn's paper—both are in the Wenzel collection and were shown. The strong lamps from the auto were used at night, but not even a mosquito was attracted.

Mr. Geo. M. Greene exhibited a very large *Megarhyssa atrata* Fabr., collected by C. T. Greene, Castle Rock, Pennsylvania, June 4, 1911, and an extremely small one collected by W. J. Nash, Overbrook, Pennsylvania, August 8, 1912. Typical specimens, male and female of *M. greenei* Viereck were also shown and the extremes in size, all collected by W. J. Nash at Overbrook, August 11 and 18, and September 8, 1912. A fine specimen of the moth, *Phlegethontius cingulata* Sm. and Abb., collected by himself on tree trunk at Overbrook, September 8, 1912, was also shown. Also a specimen of *Carabus sylvosus* Say, Castle Rock, Pennsylvania, September 2, 1912, with wing aberration.

Mr. Harbeck exhibited and recorded a butterfly *Feniseca*

tarquinius Fabr., Pocono Lake, Pennsylvania, July 23, 1912, and a pair of the hornet, *Vespa consobrina* Sauss., Manahawken, New Jersey, September 2, 1912. Two species of *Tabanus,* new to his collection, were also shown, all taken by himself.

Mr. Daecke exhibited a pair of the fly, *Stylogaster neglecta* Will., from Hunter's Run, Pennsylvania, July 28, 1912, in coitu. Had often wondered how copulation was accomplished by the species where the female has a long ovipositor but this could readily be seen in the specimens shown. Also a block covered with moss was shown to be used as a pincushion for ooo pins.

Meeting of October 16, 1912, at 1523 South Thirteenth Street, Philadelphia; twelve members were present. Mr. Green, of Easton, Pennsylvania, visitor. President Haimbach in the chair.

Mr. Wenzel, Sr., remarked on the genus *Omus,* specially mentioning a species of W. Horn's and one of Casey's. Read a communication of October 12, from Mr. Dury, of Cincinnati, Ohio, in which he says, "*Sandalus niger* Knoch (Col.) was flying around a few days ago as it does the latter part of September and beginning of October."

Dr. Skinner described his trip to Europe, giving a detailed account of the Tring Museum.

Mr. Laurent stated that, although *Ligyrus gibbosus* DeG., as well as *Chalepus trachypygus* Burm., were both common species of Coleoptera and were often numerous around the electric lights, he had never seen them in such great numbers as they were this year on the nights of June 6 and October 8 at Anglesea, New Jersey; on both of these occasions they were flying around by the hundreds.

Mr. Kaeber exhibited a large female *Vespa crabro* Linn. (Hym.) found at Darby, Pennsylvania, October 5, 1912, in hibernation. Mr. Daecke said he had taken it in New Jersey but had never seen this European species from this State before. Adjourned to the annex.

GEO. M. GREENE, *Secretary.*

IN MEMORIAM.

Frederick Blanchard.

(Portrait, Pl. II)

Frederick Blanchard, well known to students of the Coleoptera of North America, and dearly loved by all of us who knew him, died at his late home in Tyngsboro, Mass., on November 2, 1912.

He was the son of Cornelius Blanchard and Sarah Sherburne Blanchard and was born August 20, 1843, at Lowell, Mass. He was engaged in the banking business at Lowell from boyhood until his retirement about twelve years ago, at which time he had been cashier of the Prescott National Bank of Lowell for several years.

On the last day of the year 1874 he married Martha Louise Dow, of Exeter, N. H., who survives him. They had no children but adopted a son, George, who was drowned when 24 years of age, in March, 1904.

Mr. Blanchard was a loyal citizen of his township and active in promoting its welfare. He was treasurer of the Village Improvement Association of Tyngsboro for many years, and he was also much interested in the Littlefield Public Library, to which he made a bequest of $2000.

The magnetic personality of this man at once asserted itself in his delightful letters. These letters, imparting without reserve all his rich fund of entomological and other knowledge on every subject of discussion, and full of helpful suggestions and keen observations, soon came to be awaited with eager expectation, and were enjoyed with the greatest satisfaction. For he was a man who entered with enthusiasm into the interests of his friends and correspondents, and assisted them in their studies in every possible way, whatever the genus, or family, or group which might be the subject of their investigations.

His letters were in fact the principal medium of making

known to other entomologists his valuable observations and discoveries, as only a few of these appeared in print. His table of the species of *Canthon* and *Phanaeus* (Trans. Am. Ent. Soc., Vol. XII, 1885) and the revision of the genus *Cardiophorus* (Trans. Am. Ent. Soc., Vol. XVI, 1889) are the most important of his printed papers. Of the last named genus he described twelve new species.

Though beset by many misfortunes of late years, and himself an invalid for more than a year preceding his death, his entomological interest was keenly maintained up to the very end of his life, and he had practically finished only a few months ago a paper on the genus *Evarthrus*. This will probably be put together and published by his close and intimate friend and protegé, H. C. Fall.

In June, 1901, with keen expectation, the writer journeyed for the first time to Lowell, and then rode on the trolley eight miles or so up the Merrimac River to Tyngsboro, to enjoy the hospitality of the Blanchard home, which, though close to the Nashua Road, was completely hidden from it by a fine grove of pines. This was the haven to which Mr. and Mrs. Blanchard moved about the time of his retirement from the banking business, and here, in their comfortable home surrounded by the fields and meadows, they loved to entertain again and again all of us who made the pilgrimage thither. There was a perfect comradeship between man and wife which impressed us all, and their guests at once felt very much at home. We were escorted to all his famous collecting grounds, and we reveled in the treasures of his wonderful local collection, his excellent library and most of all, we took delight in the great privilege of contact with his simple and kindly personality.

Mr. Blanchard's collection, though a large one, is primarily and essentially one of New England species, very largely collected through the thorough and untiring efforts of his own eyes and hands. Like Mr. Schwarz he possessed an instinct for completely bringing to light the fauna of any locality which he visited, and, again like Mr. Schwarz, his beetles were

most neatly and beautifully mounted, suited for the minutest examination, and every family was carefully studied and its representatives accurately determined, or their names verified, by himself.

Undoubtedly Mr. Blanchard's greatest service for students of North American Coleoptera was performed in his painstaking study and interpretation of the Le Conte types for many friends, themselves unable to make the trip to Cambridge. He was a zealous admirer of Dr. Le Conte, and the Le Conte collection at the Harvard and University Museum of Comparative Zoology he understood perfectly, and he loved it too. He was a constant visitor to Cambridge, and in 1911 Harvard honored him and herself, by enrolling him in its catalogue, as Associate in Entomology of the University Museum.

He bequeathed his collection to Harvard, and it is indeed most appropriate that this collection of his own is to be placed beside that of Le Conte which he knew and loved so well.

JOHN D. SHERMAN, JR.

The daily newspapers announce the death of DR. WILLIAM ARMSTRONG BUCKHOUT, Professor of Natural History, 1871-81, and of Botany and Horticulture since 1881 in Pennsylvania State College, on December 3, 1912. He was born in Oswego, New York, December 26, 1846, and graduated from the College in which he subsequently became a professor in 1868. He wrote several articles on economic entomology in the Reports of the Pennsylvania Agricultural Experiment Station and of the State Board of Agriculture for 1889, 1892 and 1893, and contributed notes on insects to various American journals of earlier years.

The deaths of W. F. KIRBY, in England, and W. G. WRIGHT, in California, are also announced and notices of their work will appear in a later number.

The NEWS for December, 1912, was mailed December 4, 1912.

FREDERICK BLANCHARD.

EXCHANGES.

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The Entomological Exchange—For the exchange of Lepidoptera amongst reliable collectors in all parts of the world. For further information, address with return postage, Rudolf C. B. Bartsch, Secretary, 46 Guernsey St., Roslindale, Boston, Mass.

Rare Saturnidae and Parnassiinae as *Act. selene*, *Callandra* (new), *Sat. pyretorum*, *pearsoni* (new), *Hemileuca burnsi* (new), and 60 other species to exchange for American Saturnids and Parnassids, *Calleta* and *eversmanni*.—J. Henry Watson, 70 Ashford Road, Withington, Manchester, England.

For Exchange—Have for exchange Cicindelidae in sets; also other Coleoptera for Cicindelidae and Cychrus not in my collection.—Adolph Mares, 2517 Homan Ave., Chicago, Ill.

Chrysochus cobaltinus Lec. for exchange.—R. J. Smith, Milpitas, Santa Clara, Co., Cal.

Wanted for exchange—Coleoptera for native or exotic specimens—Cicindelidae, Carabus, Cychrus, Calosoma, Lucanidae, etc. List on application —Frank Psota, 1142 S. Whipple St., Chicago, Ill.

Dynastes hercules beetles direct from the original collector. Two new localities, namely St. Lucia and British Guiana, also from Dominica; for sale or exchange.—A. F. Porter, Decorah, Iowa.

Wanted—Living pupae of Saturnid moths. State quantity and price. Phil. Rau, 4932 Botanical Ave., St. Louis, Mo.

Change of Address—F. H. Wolley Dod, Millarville, Alta, to Midnapore, Alta.

For Exchange—*Cychrus andrewsii* and *Cychrus ridingsii* with full data.—T. N. Brown, 71 Highland Ave., Uniontown, Pa.

Wanted for Cash or good exchange, all American live pupae and cocoons, and 100 or more North American Parnassius in paper not expanded. Give nice exotic Lepidoptera and nice large Coleoptera.—Communicate with Monsieur Frank Sever, 333 E. 49th St., N. Y City.

Lepidoptera—Specimens of diurnals from this section in exchange for other N. A. species new to my collection.—R. A. Leussler, 1137 S. 31st St., Omaha, Neb.

Perfect, fresh mounted specimens of Nocturnal Lepidoptera (both Macro- and Micro-) from this locality offered for exchange.—Fred Marloff, Box 104, Oak Station P. O., Allegheny Co., Pa.

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Catocalae—*C. desdemona*, **beutenmulleri*, *ilia* var. sp., *aholibah*, *coloradensis*, *pura*, *faustina* and several varieties, *irene* and varieties, *aspasia* var sp., **zillah*, **lydia*, *verecunda*, *edwardsi*—only a few left of the species marked *.—Tom Spalding, R. F. D. 208z, Provo, Utah

For Exchange—A few extra entomological publications. Want Ditmar's Reptile Book, biological material, etc.—Fred. S. Carr, 163 Margueretta St , Toronto, Ontario.

Attacus atlas—Largest moth in the world. Fresh bred specimens just received from Philippine Islands, with date and locality, for sale or exchange.—A. F. Porter, Decorah, Ia.

T. Fukai, Konosu, Saitama, Japan, will send Japanese and Formosan insects, especially Lepidoptera and living cocoons. Exchange solicited.

Wanted Parnassiinae from Alaska and West Coast America in exchange for those of all European and Asian localities; particularly Thian Shan and high altitude, Himalaya Mts —J. Henry Watson, 70 Ashford Road, Withington, Manchester, England.

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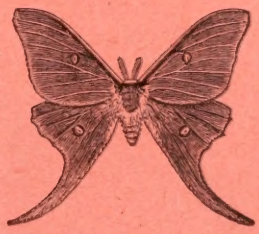

PAN-AMERICAN EXPOSITION
Gold Medal

ST. LOUIS EXPOSITION: Grand Prize and Gold Medal

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